

Development, Dielectric Response, and Functionality of ZnTiO₃/BaTiO₃/Epoxy Resin Hybrid Nanocomposites

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Supplementary Information

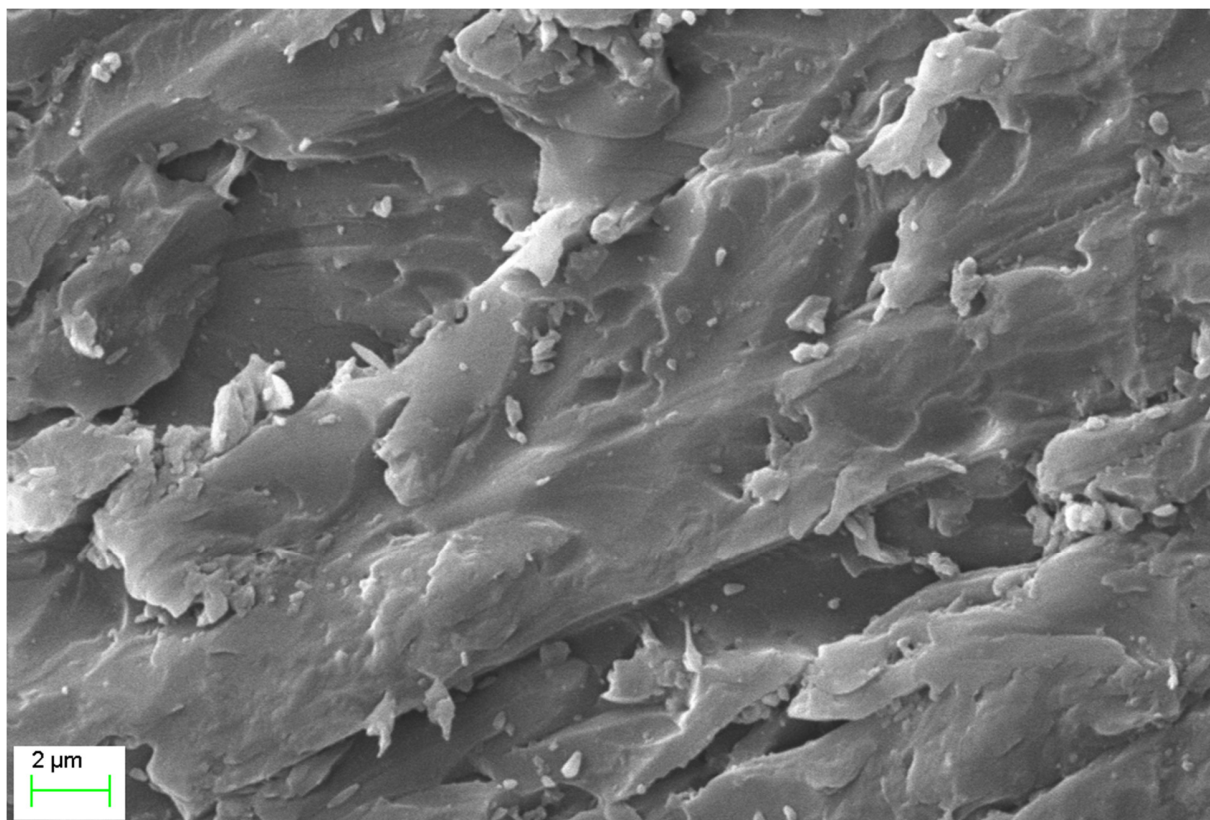
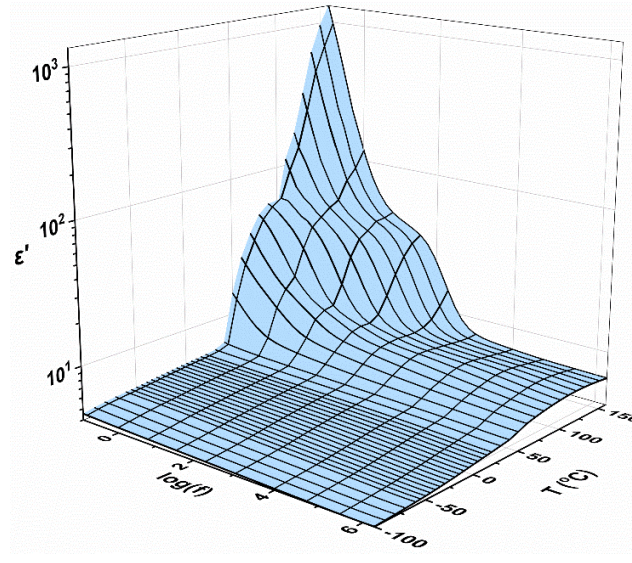
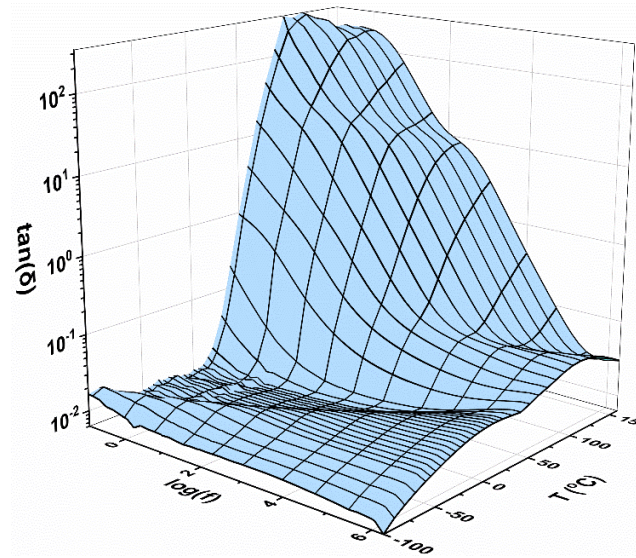


Figure S1: SEM image of a cryo-fractured cross-sectional surface for the epoxy/7 phr ZnTiO₃/7 phr BaTiO₃ nanocomposite at a lower magnification.

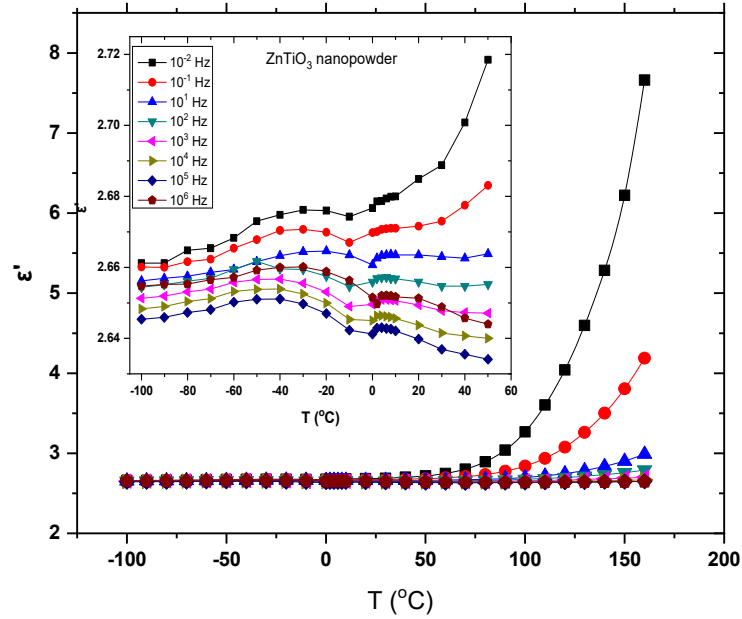


(a)

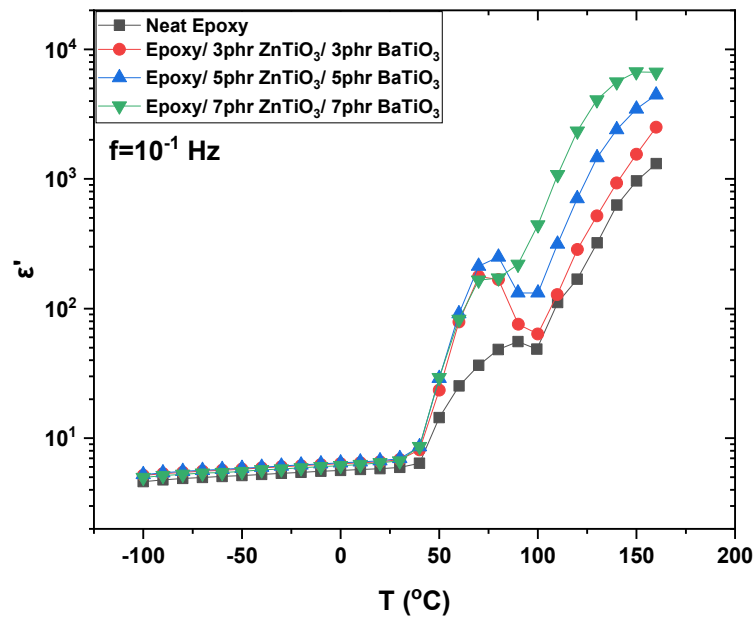


(b)

Figure S2: (a) Real part of dielectric permittivity and (b) loss $\tan\delta$ as a function of frequency and temperature for the neat epoxy.

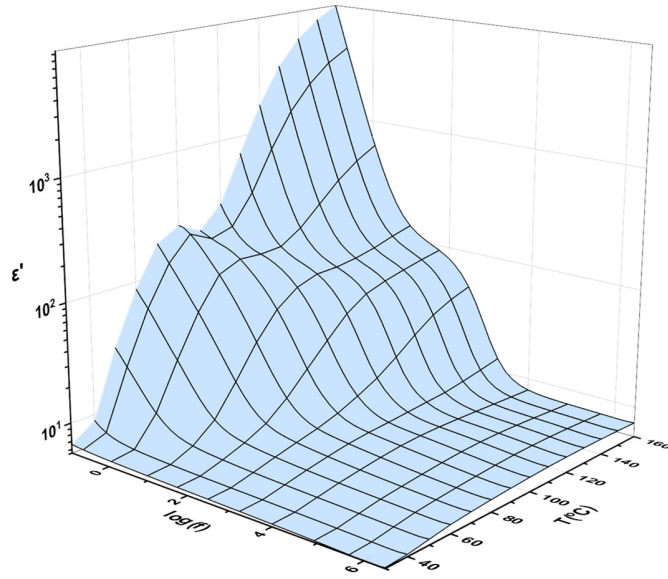


(a)

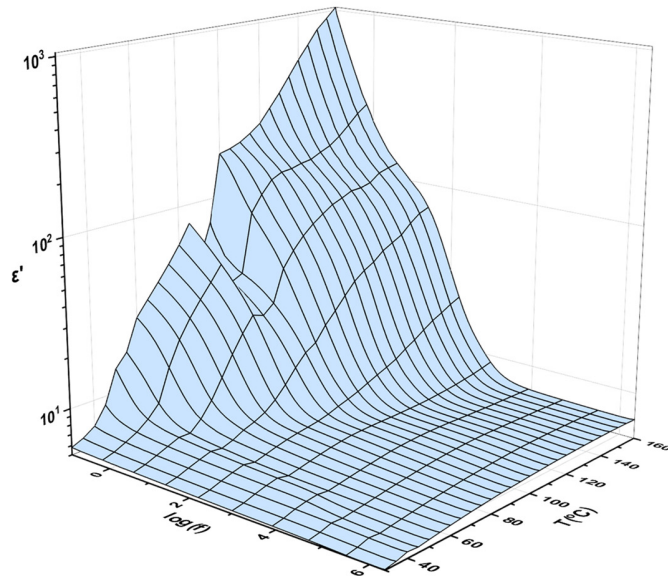


(b)

Figure S3: Real part of dielectric permittivity as a function of temperature, at 0.1 Hz for: (a) ZnTiO_3 nanoparticles (inset presents the same data at a narrower temperature range), and (b) hybrid nanocomposites and unreinforced matrix.

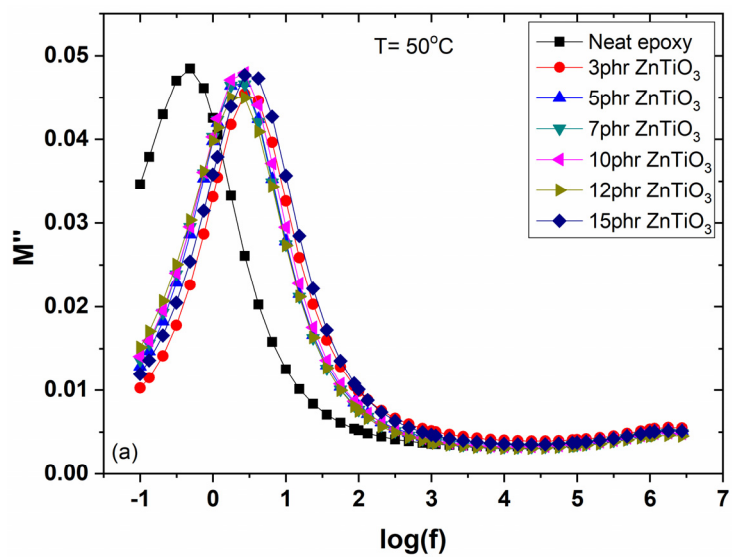


(a)

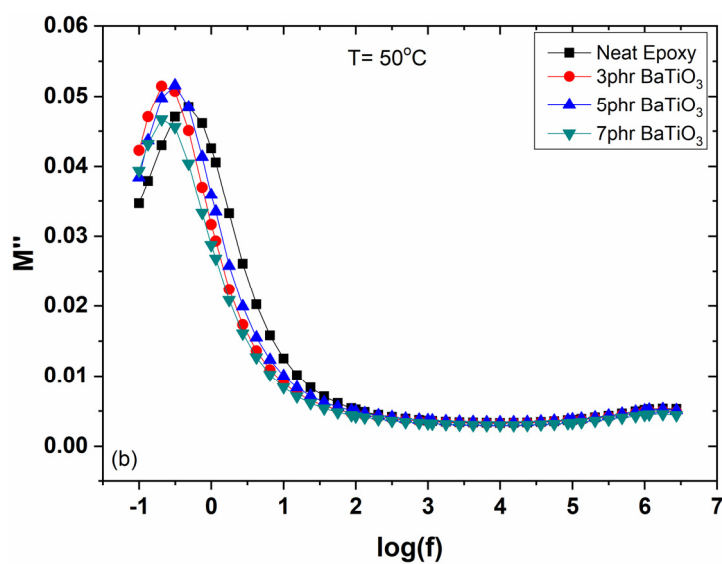


(b)

Figure S4: Real part of dielectric permittivity as a function of frequency and temperature for the: (a) epoxy/12 phr ZnTiO_3 , and (b) epoxy 12 phr BaTiO_3 nanocomposites.

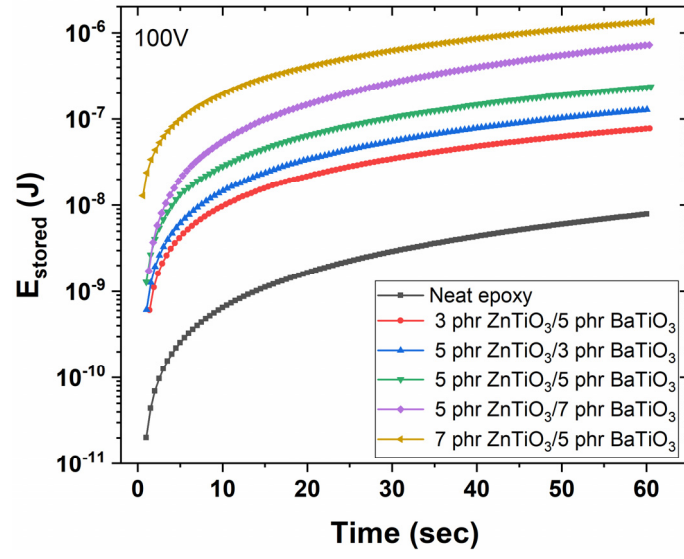


(a)

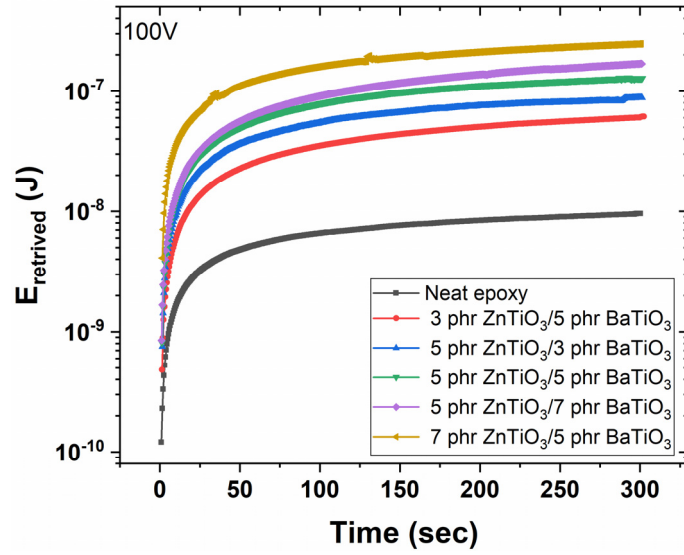


(b)

Figure S5: Imaginary part of electric modulus as a function of frequency at 50°C for the nanocomposites: (a) epoxy/x phr ZnTiO₃ and (b) epoxy/x phr BaTiO₃.



(a)



(b)

Figure S6: (a) Stored and (b) retrieved energy to the examined hybrid nanocomposites at 100 V charging voltage, as a function of time.